

National University of Ireland, Galway
OLLSCOIL NA hÉIREANN, GAILLIMH

SUMMER EXAMINATIONS 2001

3rd SCIENCE
GEOLOGY [GE 321, 323]

PAPER THREE

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Time allowed: Three hours

Answer four questions: **two** from Section A, **two** from Section B.

Illustrate your answers with diagrams where appropriate.

SECTION A

1. Explain how the Hooke's concept of elasticity and Newton's of flow in viscous fluids can help us understand deformation in rocks.
2. Why should faults show a systematic pattern with respect to the principle stress axes within the crust?
3. Either:
Explain how the concepts of fold facing and vergence can be used to understand stratigraphy in an area in which a continental margin sequence has been subjected to refolding during collisional orogenesis
or
Write a critical account of the various methods used to construct geological cross sections in a sequence of folded sedimentary rocks

4. Either:

Explain why cleavage is often parallel to the axial surface of a folded sequence during convergence and transects the fold during transpression.

or

Define isogons and show how they can be used to infer the mechanism of fold formation in a layered sequence.

SECTION B

5. "Efficient use of ecospace by a community of infaunal organisms can be achieved by vertical partitioning below the sediment-water interface (tiering) into different ecological niches". How might this be identified using trace fossils?
6. Outline the basic principles of the ichnofacies concept and recent modifications to it. Consider whether these modifications have enhanced its usefulness.
7. What is meant by the term 'shell concentration'? Discuss how the geometry of shell concentrations can provide important information on both depositional processes, and the environment of deposition.
8. Distinguish between lithostratigraphy and chronostratigraphy. Provide examples of chronostratigraphical techniques, including in your answer hypothetical and/or real examples with which you are familiar.